NAC/ISDA 2001-4

Idaho State Department of Agriculture
Nursery Advisory Committee

Final Project Report

Title: Evaluation of Corkbark and Subalpine Fir for Their Potential as Ornamental Nursery Stock and Christmas Trees

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Date: January 4, 2002

Time period covered by report: 1 January to 31 December 2001

Funding agency: Idaho Department of Agriculture, $1,131.

This report covers the second year of what is planned as a ten-year study on the growth and development of subalpine and corkbark fir from selected seed sources. In April 2000, subalpine fir (*Abies lasiocarpa* var. lasiocarpa) and corkbark fir (*Abies lasiocarpa* var. arizonica) seedlings were obtained from the University of Idaho Forest Research Nursery. The trees were grown from seed collected by Dean Swift of Jaroso, Colorado and donated to the University of Idaho for research. Seed sources represented in the collection are listed in Table 1, along with tree heights after two years in seedling styrofoam blocks.

The heights of the seedlings varied significantly within and between seed sources. In general, corkbark seedlings were taller than subalpine seedlings after two years in containers. This trend continued after one year in transplant beds.

After one year in transplant beds, the seedlings were dug on April 9, 2001 and placed inside a storage cooler at 32° to 34°F (0-4°C). Sixty seedlings of each seed source were kept at the University of Idaho Sandpoint Research and Extension Center and replanted in randomized and replicated blocks on May 2 and 3, 2001. The remaining seedlings were split between BirchHaven and PossAbilities tree farms (Bonner County, Idaho) and Paradise tree farm (Enterprise, Oregon). These trees were planted over the next several weeks.

Tree heights at the end of the third season of growth were measured shortly after planting at the Sandpoint R&E Center, BirchHaven, and PossAbilities plots. The heights of the 3-year old seedlings are shown in Figures 1 and 2. In addition to their value in evaluating growth characteristics of liner stock, the data will provide covariate values for use in later statistical analyses of maturing trees. Tree heights were not measured at Paradise tree farm. As of the end of September 2001, 958 of the 960 trees planted at the Sandpoint R&E Center survived. These trees were irrigated periodically during the summer of 2001. Survival of unirrigated trees at PossAbilities and BirchHaven farms was significantly lower for some seed sources. Precipitation in northern Idaho was below average for the summer of 2001. Paradise Farm survival data was not available at the time of this report. One-year survival data will be collected for all sites in the spring of 2002. Survival and marketability data based on summer 2001 evaluations are shown in Table 2. During 2001, these plots were used to provide training and experience in experimental design and data collection for student interns from the University of Idaho and Montana State University.

Future Plans:

Provided grant funding is available, the date of bud break (to evaluate spring frost susceptibility) and leader growth will be measured annually at the Sandpoint R&E Center, PossAbilities, and BirchHaven plots. Survival and tree heights at Paradise tree farm will be measured at the time of harvest.

Table 1. Nursery stock planted June 2000 after growing two years in containers.

Seed Source	Species	Number of Seedlings	Size Class
Arapaho National Forest	Subalpine	266	B/A
Carson N.F.	Subalpine	200	B
Cibola N.F.	Subalpine	346	B/C
Dixie N.F.	Subalpine	208	C/B
Kaibab N.F.	Subalpine	285	C/B
Manti N.F.	Subalpine	233	B/A
Rio Grande N.F.	Subalpine	263	B
Santa Isabel N.F.	Subalpine	206	B/A
San Juan N.F.	Subalpine	180	B
Uncompahgre N.F.	Subalpine	205	B/C
Apache N.F.	Corkbark	129	D
Cibola N.F.	Corkbark	157	C
Cocino N.F.	Corkbark	187	C
Coronado N.F.	Corkbark	152	C
Gila N.F.	Corkbark	179	D
Santa Fe N.F.	Corkbark	270	C/B
Size Classes: A = less than 2", B = 2-4", C = 4-6", D = 6" or taller			

Table 2. Survival and marketability rates for corkbark and subalpine fir seedlings, 3 years old. Combined data for three planting sites. Data collected during July 2001.

Seed Source	Species	Survival Rate[1] (%)	Marketability[2] (%)
Arapaho National Forest	Subalpine	96.4	65.8
Carson N.F.	Subalpine	95.2	79.5
Cibola N.F.	Subalpine	95.1	48.3
Dixie N.F.	Subalpine	100	70.2
Kaibab N.F.	Subalpine	98.1	72.3
Manti N.F.	Subalpine	100	60.9
Rio Grande N.F.	Subalpine	97.5	56.7
Santa Isabel N.F.	Subalpine	100	35.4
San Juan N.F.	Subalpine	100	67.8
Uncompahgre N.F.	Subalpine	99.1	67.8
Apache N.F.	Corkbark	100	90.7
Cibola N.F.	Corkbark	100	75.8
Cocino N.F.	Corkbark	100	85.0
Coronado N.F.	Corkbark	100	90.1
Gila N.F.	Corkbark	99.2	93.8
Santa Fe N.F.	Corkbark	91.7	88.1

1 survival = percentage of trees surviving two months after transplanting to field plots.
2 marketability = percentage of seedlings suitable for field planting after 2 years in containers and 1 year in transplant beds.

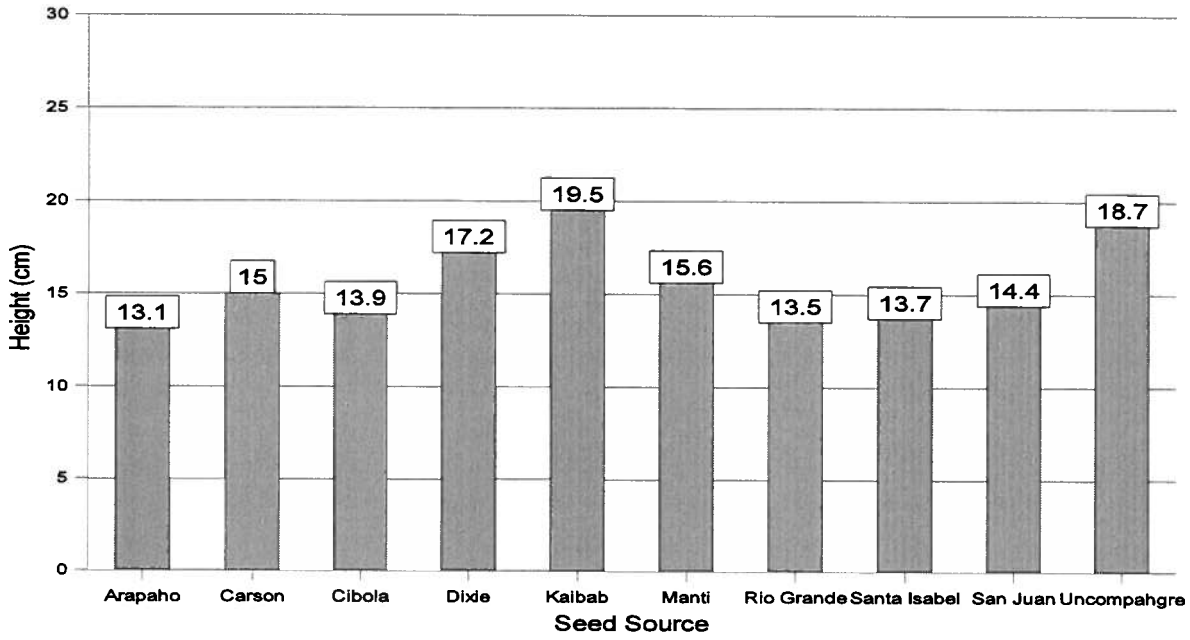

Figure 1. Heights of subalpine fir seedlings transplanted to field plots after 2 years in containers and 1 year in transplant beds.

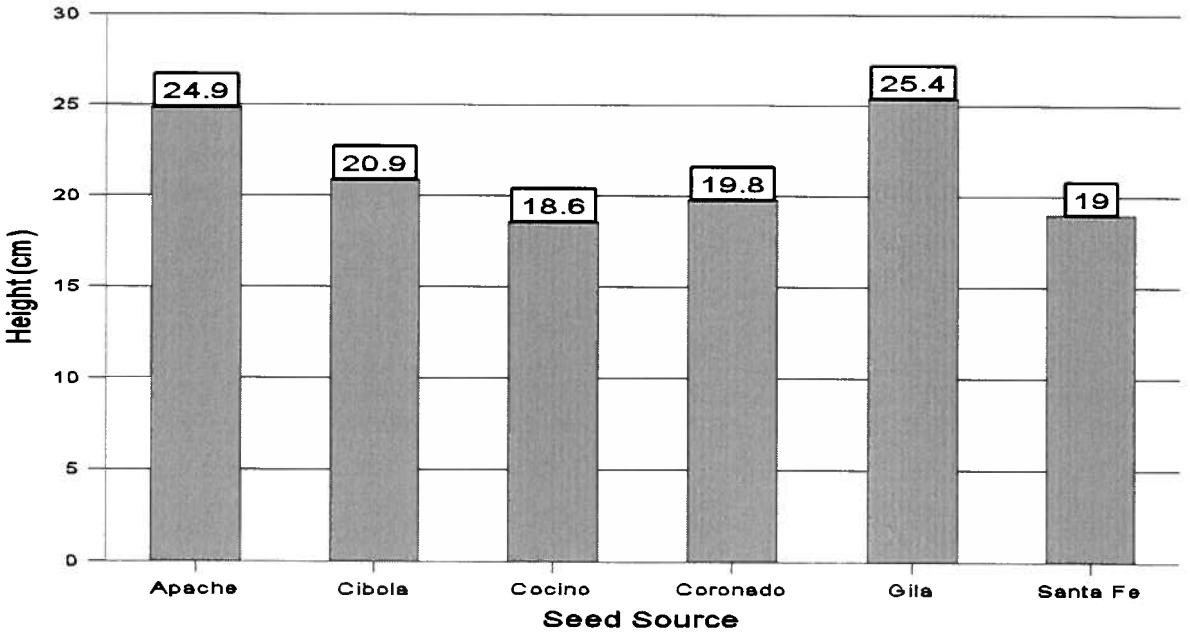

Figure 2. Heights of corkbark fir seedlings transplanted to field plots after 2 years in containers and 1 year in transplant beds.

Figure 3. Akasha Reiner, student intern, measuring survival and tree growth at the Sandpoint R&E Center. July 2001.